Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Screening for abdominal aortic aneurysm: U.S. Preventive Services Task Force recommendation statement.

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for abdominal aortic aneurysm: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2014 Aug 19;161(4):281-90. [40 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Screening for abdominal aortic aneurysm: recommendation statement. Ann Intern Med. 2005 Feb 1;142(3):198-202.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

The U.S. Preventive Services Task Force (USPSTF) grades its recommendations (A, B, C, D, or I) and identifies the levels of certainty regarding net benefit (High, Moderate, and Low). The definitions of these grades can be found at the end of the "Major Recommendations" field.

Summary of Recommendations and Evidence

The USPSTF recommends 1-time screening for abdominal aortic aneurysm (AAA) with ultrasonography in men aged 65 to 75 years who have ever smoked. (B recommendation)

The USPSTF recommends that clinicians selectively offer screening for AAA in men aged 65 to 75 years who have never smoked rather than routinely screening all men in this group. Evidence indicates that the net benefit of screening all men aged 65 to 75 years who have never smoked is small. In determining whether this service is appropriate in individual cases, patients and clinicians should consider the balance of benefits and harms on the basis of evidence relevant to the patient's medical history, family history, other risk factors, and personal values. (C recommendation)

See the Clinical Considerations section below for additional information on risk assessment.

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for AAA in women aged 65 to 75 years who have ever smoked. (I statement)

See the Clinical Considerations section below for suggestions for practice regarding the I statement.

The USPSTF recommends against routine screening for AAA in women who have never smoked. (D recommendation)

These recommendations apply to asymptomatic adults aged 50 years or older. For the purposes of this recommendation, an "ever-smoker" is a person who has smoked at least 100 cigarettes in his or her lifetime.

See the Figure in the original guideline document for a summary of the recommendation and suggestions for clinical practice.

Clinical Considerations

Patient Population Under Consideration

This recommendation applies to asymptomatic adults aged 50 years or older.

Assessment of Risk

Smoking Status

Smoking 100 or more cigarettes is commonly used in epidemiologic literature to define an "ever-smoker." However, the randomized trials of screening for AAA did not gather specific data about participants' smoking histories. Occasional tobacco use for a short time in the past (for example, occasional "social" smoking as an adolescent or young adult) is unlikely to have a pronounced biological effect, and the odds ratio (OR) of developing a large (≥5.0 cm) AAA is actually less than 1.0 for prior smokers who have quit for at least 10 years. However, observational studies have found that even a relatively modest smoking history (for example, smoking a half-pack or less per day for fewer than 10 years) does increase the likelihood of developing a large AAA.

Screening in Men Aged 65 to 75 Years Who Have Never Smoked

Despite the demonstrated benefits of screening for AAA in men overall, the lower prevalence in male never-smokers versus male ever-smokers suggests that clinicians should consider a patient's risk factors and the potential for harm before screening for AAA rather than routinely offering screening to all male never-smokers. Important risk factors include older age and a first-degree relative with an AAA; other risk factors include a history of other vascular aneurysms, coronary artery disease, cerebrovascular disease, atherosclerosis, hypercholesterolemia, obesity, and hypertension. Factors associated with a reduced risk include African American race, Hispanic ethnicity, and diabetes.

Suggestions for Practice Regarding the I Statement

Screening in Women Aged 65 to 75 Years Who Have Ever Smoked

Potential Preventable Burden

A screening study in Sweden found that the prevalence of AAA in women aged 70 years was low (0.8%) for ever-smokers but increased to 2.0% for current smokers. A meta-analysis of individual-patient data found that women have a higher risk than men for rupture at the same diameter (hazard ratio [HR], 3.76 [95% confidence interval (CI), 2.58 to 5.47]). However, AAA-associated deaths occur at an older age in women (at a time of increased competing causes of death and a declining benefit-risk ratio for operative interventions), with 70% of deaths occurring after age 80 years in women compared with fewer than 50% in men. In the only screening randomized, controlled trial (RCT) that included women, most screen-detected AAAs in women were small (3.0 to 3.9 cm), and AAA-specific mortality was low in screened and unscreened women (<0.2%) after 10 years.

Potential Harms

Four RCTs (primarily done in men) showed that screening doubled the rate of AAA-associated surgeries, largely driven by an increase in elective surgeries. Most screen-detected AAAs were below the 5.5-cm threshold for immediate repair. This finding generally results in long-term or lifelong surveillance and is probably associated with some amount of overtreatment, although the magnitude of this burden is difficult to quantify.

Most screening trials reported an associated decrease in emergency repairs and a reduced 30-day mortality rate associated with emergency surgery in populations invited to screening, although mortality associated with elective surgery was not reduced. Operative mortality associated with AAAs is higher in women than in men (7% vs. 5% for open repair and 2% vs. 1% for endovascular repair, respectively).

Costs

In addition to the cost of ultrasonography screening (approximately $100), the estimated potential associated cost of elective surgery to repair a screen-detected AAA ranges from $37,000 to $43,000. Potential opportunity costs may also arise, because screening may take the place of other

preventive activities that may be more beneficial to the patient.

Current Practice

Screening for AAA is provided as part of the "welcome-to-Medicare visit" for women who have a family history of AAA. However, the evidence is insufficient to accurately characterize current practice patterns related to screening for AAA in women.

A retrospective analysis from 2000 to 2010 used the National Inpatient Sample, a database that has a stratified 20% random sample of all nonfederal inpatient hospital admissions in the United States. This analysis found that women are more likely than men to have open surgery versus endovascular aneurysm repair (EVAR) for enraptured AAA (24% vs. 17%, respectively), potentially because of issues with access to the iliac artery (that is, smaller artery size) that may preclude endovascular management.

A retrospective review of 4026 AAA repairs in the Vascular Study Group of New England database (a voluntary registry from 30 academic and community hospitals in the 6 New England states) reported that women were more likely than men to have open surgery versus EVAR and to be older and have smaller aortic diameters at the time of repair. Postoperative complications were higher in women than in men after elective EVAR or open repair, including emergency reoperations, dysrhythmias, leg ischemia or emboli, bowel ischemia, or need for discharge to another medical facility rather than home.

Screening Methods

Conventional abdominal duplex ultrasonography was the primary method used in the available trials of AAA screening, and primary care physicians and vascular surgeons widely accept it as the standard approach to screening. Screening with ultrasonography is noninvasive and easy to do and has high sensitivity (94% to 100%) and specificity (98% to 100%) for detecting AAA. In addition, it has shown high rates of reproducibility, does not expose patients to radiation, and is relatively low-cost.

The use of handheld, portable ultrasonography devices in clinician office settings has been proposed as an alternative approach to conventional abdominal duplex ultrasonography done in the radiology setting. Several small observational studies suggest that in-office handheld ultrasonography has reasonable sensitivity and specificity for AAA detection compared with conventional ultrasonography. However, it has not been formally evaluated in a clinical trial.

Screening Intervals

Evidence is adequate to support 1-time screening in men who have ever smoked. All of the population-based RCTs of AAA screening used a 1-time screening approach, and several fair- to good-quality prospective cohort studies show that AAA-associated mortality over 5 to 12 years is low (0.0% to 2.4%) in men with initially normal results on ultrasonography.

Treatment

In the available screening trials, immediate referral for open surgery in patients with large AAAs (≥5.5 cm) and conservative management via repeated ultrasonography every 3 to 12 months for smaller AAAs (3.0 to 5.4 cm) achieved the observed AAA-related mortality benefit. Surgical referral of smaller AAAs was reserved for those that grew rapidly (>1.0 cm per year) or reached a threshold of 5.5 cm or larger on repeated ultrasonography.

Although early open surgery for smaller AAAs reduces the risk for rupture compared with surveillance, it does not reduce AAA-specific or all-cause mortality. Endovascular aneurysm repair is an alternative to open surgery. As with open surgery, early EVAR did not differ from surveillance for smaller AAAs in all-cause or AAA-related mortality in randomized trials that evaluated these interventions. Unlike early open surgery, early EVAR does not reduce the incidence of rupture.

Pharmacotherapy has been proposed to slow the growth of smaller AAAs. Short-term treatment with antibiotics or β-blockers does not seem to reduce growth, and the trials were underpowered to draw conclusions about effects on health outcomes.

Definitions:

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer/provide this service.

Grade	Grade Definitions	Suggestions for Practice
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer/provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer/provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.	Read "Clinical Considerations" section of USPSTF Recommendation Statement (see "Major Recommendations" field). If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The USPSTF defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Clinical Algorithm(s)

None available

Scope

Disease/Condition(s)

Abdominal aortic aneurysm (AAA)

Guideline Category

Prevention

Risk Assessment

Screening

Clinical Specialty

Cardiology

Family Practice

Internal Medicine

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

- To summarize the current U.S. Preventive Services Task Force (USPSTF) recommendations and supporting evidence on screening for abdominal aortic aneurysm (AAA)
- To update the 2005 recommendations on screening for AAA

Target Population

Asymptomatic adults aged 50 years or older

Interventions and Practices Considered

Screening for abdominal aortic aneurysm (AAA) with ultrasonography

Major Outcomes Considered

Key Question 1: What is the effect of 1-time abdominal aortic aneurysm (AAA) screening on health outcomes in an asymptomatic population aged ≥50 years?

a. Does the effect of 1-time screening vary between men and women, smokers and nonsmokers, older (≥65 years) and younger (>65 years) patients, patients with and without a family history of AAA and patients of different races/ethnicities?
b. Does the effect of 1-time screening vary between different screening approaches?

Key Question 2: What is the effect of rescreening for AAAs on health outcomes or AAA incidence in a previously screened, asymptomatic population without AAA?

a. Does the effect of rescreening vary between men and women, sizes of AAA, smokers and nonsmokers, older (≥65 years) and younger (<65 years) patients, patients with and without a family history of AAA, and patients of different races/ethnicities?
b. Does the effect of rescreening vary between different time intervals?

Key Question 3: What are the harms associated with 1-time and repeated AAA screening?

Key Question 4: What is the effect of pharmacotherapy versus placebo or surgery (open repair and endovascular aneurysm repair [EVAR]) versus surveillance on treatment-relevant intermediate health outcomes in an asymptomatic population with small AAAs (3.0–5.4 cm) identified by screening?

a. Does the effect of pharmacotherapy, surgery, and surveillance differ between men and women, smaller (3.0–4.0 cm) and larger (4.1–5.4 cm) aneurysms, smokers and nonsmokers, older (≥65 years) and younger (<65 years) patients, patients with and without a family history of AAA, patients with and without diabetes, patients with and without chronic obstructive pulmonary disease (COPD), and patients of different races/ethnicities?

Key Question 5: What harms are associated with pharmacotherapy, EVAR and open AAA repair surgery, and surveillance in an asymptomatic population with small AAAs (3.0–5.4 cm) identified by screening?

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Kaiser Permanente Research Affiliates Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Sources and Searches

EPC staff searched MEDLINE, the Database of Abstracts of Reviews of Effects, and the Cochrane Central Registry of Controlled Trials for relevant English-language studies published between January 2004 and January 2013. They searched for screening trials through September 2013 in MEDLINE and supplemented searches with suggestions from experts and considered all articles included in the previous review for the USPSTF. EPC staff also reviewed reference lists of relevant systematic reviews and meta-analyses.

Study Selection

Two investigators independently reviewed abstracts and full-text articles for inclusion according to predetermined criteria. They resolved discrepancies through consensus with a third investigator. EPC staff considered randomized, controlled trials (RCTs) and large cohort studies (≥1000 participants) of asymptomatic adult populations for key questions examining the effectiveness of 1-time and repeated screening. For the

key question examining the harms of screening for abdominal aortic aneurysms (AAAs), they considered RCTs and observational studies. Ultrasonography was the only screening method considered. For all bodies of evidence, EPC staff excluded studies that were rated as poor-quality on the basis of the USPSTF quality rating standards.

Number of Source Documents

- Key Question 1: 12 articles (4 studies)
- Key Question 2: 11 articles (10 studies)
- Key Question 3: 7 articles (7 studies)
- Key Question 4: 21 articles (15 studies)
- Key Question 5: 17 articles (15 studies)

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Two reviewers independently assessed the methodological quality of each study using predefined criteria developed by the U.S. Preventive Services Task Force (USPSTF) and supplemented with the National Institute for Health and Care Excellence methodology checklists for observational studies. Disagreements in quality were resolved by discussion. Each study was given a final quality rating of good, fair, or poor (see "Quality Assessment of Evidence" in the evidence review [see the "Availability of Companion Documents" field]).

Methods Used to Analyze the Evidence

Meta-Analysis of Randomized Controlled Trials

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Kaiser Permanente Research Affiliates Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Extraction and Quality Assessment

One investigator extracted data, and a second investigator reviewed these data. Two investigators completed independent, critical appraisals of all relevant studies using the USPSTF's design-specific criteria, the National Institute for Health and Care Excellence methodology checklists, the Quality Assessment of Diagnostic Accuracy Studies, and the Newcastle-Ottawa Scale. According to the USPSTF criteria, a good-quality study met all prespecified standards. A fair-quality study did not meet (or it was unclear whether it met) at least 1 criterion, but it also had no known limitation that could invalidate its results. A poor-quality study had a single fatal flaw or several important limitations that could likely bias results.

Data Synthesis and Analysis

EPC staff qualitatively synthesized data for each key question by summarizing relevant details and results for each included study. Although they decided a priori to pool studies for all outcomes using DerSimonian-Laird random effects models, EPC staff report quantitative analyses only for all-cause mortality. When they pooled abdominal aortic aneurysm (AAA)-related mortality and screening harms, the summary effects showed high statistical heterogeneity at the longest follow-up. Thus, EPC staff present forest plots with no pooled summaries. In addition, they did not pool studies examining the effectiveness of rescreening because of substantial differences in patient population, length of follow-up, and reported outcomes. For all pooled results using the DerSimonian-Laird random effects models, see the full evidence report.

For all-cause mortality, EPC staff conducted planned random effects analyses using the DerSimonian-Laird method. They conducted sensitivity analyses using a fixed-effect model as well as the profile likelihood method because there were only 3 trials and the DerSimonian-Laird method can underestimate uncertainty when the number of trials is small. The 2 methods resulted in identical effect estimates and confidence intervals (CIs). EPC staff examined heterogeneity across trials with the chi-square test for heterogeneity.

Methods Used to Formulate the Recommendations

Balance Sheets

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The U.S. Preventive Services Task Force (USPSTF) systematically reviews the evidence concerning both the benefits and harms of widespread implementation of a preventive service. It then assesses the certainty of the evidence and the magnitude of the benefits and harms. On the basis of this assessment, the USPSTF assigns a letter grade to each preventive service signifying its recommendation about provision of the service (see Table below). An important, but often challenging, step is determining the balance between benefits and harms to estimate "net benefit" (that is, benefits minus harms).

Table 1. U.S. Preventive Services Task Force Recommendation Grid*

Certainty of Net Benefit	Magnitude of Net Benefit			
	Substantial	Moderate	Small	Zero/Negative
High	A	B	C	D
Moderate	B	B	C	D
Low	Insufficient			

**A, B, C, D, and I (Insufficient)* represent the letter grades of recommendation or statement of insufficient evidence assigned by the USPSTF after assessing certainty and magnitude of net benefit of the service (see the "Rating Scheme for the Strength of the Recommendations" field).

The overarching question that the USPSTF seeks to answer for every preventive service is whether evidence suggests that provision of the service would improve health outcomes if implemented in a general primary care population. For screening topics, this standard could be met by a large randomized, controlled trial (RCT) in a representative asymptomatic population with follow-up of all members of both the group "invited for screening" and the group "not invited for screening."

Direct RCT evidence about screening is often unavailable, so the USPSTF considers indirect evidence. To guide its selection of indirect evidence, the USPSTF constructs a "chain of evidence" within an analytic framework. For each key question, the body of pertinent literature is critically appraised, focusing on the following 6 questions:

1. Do the studies have the appropriate research design to answer the key question(s)?
2. To what extent are the existing studies of high quality? (i.e., what is the internal validity?)
3. To what extent are the results of the studies generalizable to the general U.S. primary care population and situation? (i.e., what is the external validity?)
4. How many studies have been conducted that address the key question(s)? How large are the studies? (i.e., what is the precision of the evidence?)
5. How consistent are the results of the studies?
6. Are there additional factors that assist the USPSTF in drawing conclusions (e.g., presence or absence of dose–response effects, fit within a biologic model)?

The next step in the USPSTF process is to use the evidence from the key questions to assess whether there would be net benefit if the service were implemented. In 2001, the USPSTF published an article that documented its systematic processes of evidence evaluation and recommendation development. At that time, the USPSTF's overall assessment of evidence was described as good, fair, or poor. The USPSTF

realized that this rating seemed to apply only to how well studies were conducted and did not fully capture all of the issues that go into an overall assessment of the evidence about net benefit. To avoid confusion, the USPSTF has changed its terminology. Whereas individual study quality will continue to be characterized as good, fair, or poor, the term certainty will now be used to describe the USPSTF's assessment of the overall body of evidence about net benefit of a preventive service and the likelihood that the assessment is correct. Certainty will be determined by considering all 6 questions listed above; the judgment about certainty will be described as high, moderate, or low.

In making its assessment of certainty about net benefit, the evaluation of the evidence from each key question plays a primary role. It is important to note that the USPSTF makes recommendations for real-world medical practice in the United States and must determine to what extent the evidence for each key question—even evidence from screening RCTs or treatment RCTs—can be applied to the general primary care population. Frequently, studies are conducted in highly selected populations under special conditions. The USPSTF must consider differences between the general primary care population and the populations studied in RCTs and make judgments about the likelihood of observing the same effect in actual practice.

It is also important to note that one of the key questions in the analytic framework refers to the potential harms of the preventive service. The USPSTF considers the evidence about the benefits and harms of preventive services separately and equally. Data about harms are often obtained from observational studies because harms observed in RCTs may not be representative of those found in usual practice and because some harms are not completely measured and reported in RCTs.

Putting the body of evidence for all key questions together as a chain, the USPSTF assesses the certainty of net benefit of a preventive service by asking the 6 major questions listed above. The USPSTF would rate a body of convincing evidence about the benefits of a service that, for example, derives from several RCTs of screening in which the estimate of benefits can be generalized to the general primary care population as "high" certainty (see the "Rating Scheme for the Strength of the Recommendations" field). The USPSTF would rate a body of evidence that was not clearly applicable to general practice or has other defects in quality, research design, or consistency of studies as "moderate" certainty. Certainty is "low" when, for example, there are gaps in the evidence linking parts of the analytic framework, when evidence to determine the harms of treatment is unavailable, or when evidence about the benefits of treatment is insufficient. Table 4 in the methodology document listed below (see the "Availability of Companion Documents" field) summarizes the current terminology used by the USPSTF to describe the critical assessment of evidence at all 3 levels: individual studies, key questions, and overall certainty of net benefit of the preventive service.

Sawaya GF, Guirguis-Blake J, LeFevre M, Harris R, Petitti D; U.S. Preventive Services Task Force. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med. 2007;147(12):871-875. [5 references].

I Statements

For I statements, the USPSTF has a new plan to commission its Evidence-based Practice Centers to collect information in 4 domains pertinent to clinical decisions about prevention and to report this information routinely. This plan is described in the paper: Petitti DB et al. Update on the methods of the U.S. Preventive Services Task Force: insufficient evidence. Ann Intern Med. 2009;150:199-205. www.annals.org .

The first domain is potential preventable burden of suffering from the condition. When evidence is insufficient, provision of an intervention designed to prevent a serious condition (such as dementia) might be viewed more favorably than provision of a service designed to prevent a condition that does not cause as much suffering (such as rash). The USPSTF recognized that "burden of suffering" is subjective and involves judgment. In clinical settings, it should be informed by patient values and concerns.

The second domain is potential harm of the intervention. When evidence is insufficient, an intervention with a large potential for harm (such as major surgery) might be viewed less favorably than an intervention with a small potential for harm (such as advice to watch less television). The USPSTF again acknowledges the subjective nature and the difficulty of assessing potential harms: for example, how bad is a "mild" stroke?

The third domain is cost—not just monetary cost, but opportunity cost, in particular the amount of time a provider spends to provide the service, the amount of time the patient spends to partake of it, and the benefits that might derive from alternative uses of the time or money for patients, clinicians, or systems. Consideration of clinician time is especially important for preventive services with only insufficient evidence because providing them could "crowd out" provision of preventive services with proven value, services for conditions that require immediate action, or services more desired by the patient. For example, a decision to routinely inspect the skin could take up the time available to discuss smoking cessation, or to address an acute problem or a minor injury that the patient considers important.

The fourth domain is current practice. This domain was chosen because it is important to clinicians for at least 2 reasons. Clinicians justifiably fear that not doing something that is done on a widespread basis in the community may lead to litigation. More important, addressing patient expectations is a crucial part of the clinician–patient relationship in terms of building trust and developing a collaborative therapeutic relationship. The consequences of not providing a service that is neither widely available nor widely used are less serious than not providing a service accepted

by the medical profession and thus expected by patients. Furthermore, ingrained care practices are difficult to change, and efforts should preferentially be directed to changing those practices for which the evidence to support change is compelling.

Although the reviewers did not explicitly recognize it when these domains were chosen, the domains all involve consideration of the potential consequences—for patients, clinicians, and systems—of providing or not providing a service. Others writing about medical decision making in the face of uncertainty have suggested that the consequences of action or inaction should play a prominent role in decisions.

Rating Scheme for the Strength of the Recommendations

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer/provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer/provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer/provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.	Read "Clinical Considerations" section of USPSTF Recommendation Statement (see "Major Recommendations" field). If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The USPSTF defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.

Level of Certainty	Description
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Peer Review. Before the U.S. Preventive Services Task Force (USPSTF) makes its final determinations about recommendations on a given preventive service, the Evidence-based Practice Center and the Agency for Healthcare Research and Quality send the draft evidence review to 4 to 6 external experts and to Federal agencies and professional and disease-based health organizations with interests in the topic. The experts are asked to examine the review critically for accuracy and completeness and to respond to a series of specific questions about the document. After assembling these external review comments and documenting the proposed response to key comments, the topic team presents this information to the USPSTF in memo form. In this way, the USPSTF can consider these external comments before it votes on its recommendations about the service. Draft recommendation statements are then circulated for comment among reviewers representing professional societies, voluntary organizations, and Federal agencies, as well as posted on the USPSTF Web site for public comment. These comments are discussed before the final recommendations are confirmed.

Response to Public Comment. A draft version of this recommendation statement was posted for public comment on the USPSTF Web site from 28 January to 24 February 2014. In response to the comments received, the USPSTF clarified the definition of an "ever-smoker." It provided information about the absolute benefits of screening for abdominal aortic aneurysm (AAA) as reported in the Multicentre Aneurysm Screening Study (MASS) to provide additional context for the reported relative risk reductions. The USPSTF also expanded the discussion relating to the risks and benefits of screening and treatment in women compared with those in men (see Suggestions for Practice Regarding the I Statement: Current Practice [see the "Major Recommendations" field]). Finally, the USPSTF emphasized that more research—including high-quality modeling studies—is required to better understand the relative benefits and harms of screening for AAA in men and women with a family history of AAA and for women who have ever smoked.

Comparison with Guidelines from Other Groups. Recommendations for screening from the following groups were discussed: the American College of Cardiology, the American Heart Association, the Society for Vascular Surgery, the American College of Preventive Medicine, the Canadian Society for Vascular Surgery, and the European Society for Vascular Surgery.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Benefits of Detection and Early Treatment

- Men aged 65 to 75 years who have ever smoked: Four large, population-based, randomized, controlled trials (RCTs) show that invitation to 1-time screening for abdominal aortic aneurysms (AAAs) is associated with reduced AAA-specific mortality in men. This benefit begins 3 years after testing and persists up to 15 years. In addition, risk reduction for AAA rupture and emergency surgery persists up to 10 to 13 years.
- Men aged 65 to 75 years who have never smoked: Adequate evidence shows that 1-time screening with ultrasonography results in a small benefit in men aged 65 to 75 years who have never smoked.
- Women aged 65 to 75 years who have ever smoked: Evidence is inadequate to conclude whether 1-time screening for AAA with ultrasonography is beneficial in women aged 65 to 75 years who have ever smoked.
- Women who have never smoked: Adequate evidence shows that the absolute benefit of 1-time screening for AAA with ultrasonography in women who have never smoked can effectively be bounded at none or almost none.
- See the "Benefits of Detection and Early Treatment" section in the original guideline document for more information.

Potential Harms

Harms of Detection and Early Treatment

- In the available trials, groups invited to screening were approximately twice as likely as control groups to have any abdominal aortic aneurysm (AAA) surgery within 3 to 5 years, predominantly driven by an increase in elective surgeries. More than 90% of AAAs identified by screening were below the 5.5-cm threshold for immediate repair. Detecting smaller AAAs generally leads to long-term (potentially lifelong) surveillance.
- A person's risk for death related to elective surgery for AAA is lower than that for death related to emergency surgery for rupture. However, the increase in the overall rates of detection and surgery in the screening groups still potentially represents a harm. A proportion of AAAs will never rupture because they do not advance or because a person dies of a competing cause.
- The exact extent of overdiagnosis and overtreatment is difficult to estimate. One study from Massachusetts General Hospital reviewed 24,000 consecutive autopsies between 1952 and 1975 and found that 75% of the 473 patients who died with an undetected or unoperated AAA had a cause of death not related to the AAA (41% were 5.1 cm in diameter). Given that even elective treatment is associated with some risk for perioperative mortality, overtreatment is an important issue to consider when deciding whether to screen for this condition.
- One study reported that women had a higher risk for death related to AAA surgery than men; death rates of women and men were approximately 7% versus 5% for open repair and 2% versus 1% for endovascular repair, respectively. Evidence is limited and conflicting about the effect of screening on quality of life or psychological status (for example, anxiety). Convincing evidence shows that the harms associated with 1-time screening with ultrasonography are at least small in all populations and potentially higher in women because of the greater risk for operative mortality.

Qualifying Statements

Qualifying Statements

- The U.S. Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific clinical preventive services for patients without related signs or symptoms.
- It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.
- The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.
- Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of

the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

Implementation of the Guideline

Description of Implementation Strategy

The experiences of the first and second U.S. Preventive Services Task Force (USPSTF), as well as that of other evidence-based guideline efforts, have highlighted the importance of identifying effective ways to implement clinical recommendations. Practice guidelines are relatively weak tools for changing clinical practice when used in isolation. To effect change, guidelines must be coupled with strategies to improve their acceptance and feasibility. Such strategies include enlisting the support of local opinion leaders, using reminder systems for clinicians and patients, adopting standing orders, and audit and feedback of information to clinicians about their compliance with recommended practice.

In the case of preventive services guidelines, implementation needs to go beyond traditional dissemination and promotion efforts to recognize the added patient and clinician barriers that affect preventive care. These include clinicians' ambivalence about whether preventive medicine is part of their job, the psychological and practical challenges that patients face in changing behaviors, lack of access to health care or of insurance coverage for preventive services for some patients, competing pressures within the context of shorter office visits, and the lack of organized systems in most practices to ensure the delivery of recommended preventive care.

Dissemination strategies have changed dramatically in this age of electronic information. While recognizing the continuing value of journals and other print formats for dissemination, the USPSTF will make all its products available through its Web site . The combination of electronic access and extensive material in the public domain should make it easier for a broad audience of users to access USPSTF materials and adapt them for their local needs. Online access to USPSTF products also opens up new possibilities for the appearance of the annual, pocket-size Guide to Clinical Preventive Services.

To be successful, approaches for implementing prevention have to be tailored to the local level and deal with the specific barriers at a given site, typically requiring the redesign of systems of care. Such a systems approach to prevention has had notable success in established staff-model health maintenance organizations, by addressing organization of care, emphasizing a philosophy of prevention, and altering the training and incentives for clinicians. Staff-model plans also benefit from integrated information systems that can track the use of needed services and generate automatic reminders aimed at patients and clinicians, some of the most consistently successful interventions. Information systems remain a major challenge for individual clinicians' offices, however, as well as for looser affiliations of practices in network-model managed care and independent practice associations, where data on patient visits, referrals, and test results are not always centralized.

Implementation Tools

Foreign Language Translations

Mobile Device Resources

Patient Resources

Pocket Guide/Reference Cards

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for abdominal aortic aneurysm: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2014 Aug 19;161(4):281-90. [40 references] PubMed

Adaptation

Not applicable: The guideline is not adapted from another source.

Date Released

1996 (revised 2014 Aug 19)

Guideline Developer(s)

U.S. Preventive Services Task Force - Independent Expert Panel

Guideline Developer Comment

The U.S. Preventive Services Task Force (USPSTF) is a federally-appointed panel of independent experts. Conclusions of the USPSTF do not necessarily reflect policy of the U.S. Department of Health and Human Services or its agencies.

Source(s) of Funding

The U.S. Preventive Services Task Force (USPSTF) is an independent, voluntary body. The U.S. Congress mandates that the Agency for Healthcare Research and Quality support the operations of the USPSTF.

Guideline Committee

U.S. Preventive Services Task Force (USPSTF)

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**Members of the USPSTF at the time this recommendation was finalized. For a list of current Task Force members, go to http://www.uspreventiveservicestaskforce.org/Page/Name/our-members*.

Financial Disclosures/Conflicts of Interest

The U.S. Preventive Services Task Force (USPSTF) has an explicit policy concerning conflict of interest. All members disclose at each meeting if they have a significant financial, professional/business, or intellectual conflict for each topic being discussed. USPSTF members with conflicts may be recused from discussing or voting on recommendations about the topic in question.

Disclosures

Dr. Owens reports support from the Agency for Healthcare Research and Quality. Authors not named here have disclosed no conflicts of interest. Authors followed the policy regarding conflicts of interest described at http://www.uspreventiveservicestaskforce.org/Page/Name/methods-and-processes. Disclosures can also be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M14-1204.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Screening for abdominal aortic aneurysm: recommendation statement. Ann Intern Med. 2005 Feb 1;142(3):198-202.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Electronic copies: Available from the Annals of Internal Medicine Web site.

Availability of Companion Documents

The following are available:

Evidence Reviews:

- Guirguis-Blake JM, Beil TL, Sun X, Senger CA, Whitlock EP. Primary care screening for abdominal aortic aneurysm: a systematic evidence review for the U.S. Preventive Services Task Force. Evidence Synthesis No. 109. AHRQ Publication No. 14-05202-EF-1. Rockville (MD): Agency for Healthcare Research and Quality; 2014 Jan. 153 p.
- Guirguis-Blake JM, Beil TL, Senger CA, Whitlock EP. Ultrasonography screening for abdominal aortic aneurysms: a systematic review for the U.S. Preventive Services Task Force. Ann Intern Med, 2014;160(5):321-329.

Electronic copies: Available from the U.S. Preventive Services Task Force (USPSTF) Web site.

Background Articles:

- Barton MB et al. How to read the new recommendation statement: methods update from the U.S. Preventive Services Task Force. Ann Intern Med 2007;147:123-127.
- Guirguis-Blake J et al. Current processes of the U.S. Preventive Services Task Force: refining evidence-based recommendation development. Ann Intern Med 2007;147:117-122.

- Sawaya GF et al. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med 2007;147:871-875.
- Petitti DB et al. Update on the methods of the U.S. Preventive Services Task Force: insufficient evidence. Ann Intern Med. 2009;150:199-205.

Electronic copies: Available from the USPSTF Web site.

The following is also available:

- Screening for abdominal aortic aneurysm. Clinical summary of U.S. Preventive Services Task Force Recommendation. 2014 Jun. 1 p. Electronic copies: Available from the USPSTF Web site.
- A continuing medical education (CME) activity is available from the Annals of Internal Medicine Web site.
- The guide to clinical preventive services, 2014. Recommendations of the U.S. Preventive Services Task Force. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2014. 144 p. Electronic copies: Available from the AHRQ Web site.

The Electronic Preventive Services Selector (ePSS) is an application designed to provide primary care clinicians and health care teams timely decision support regarding appropriate screening, counseling, and preventive services for their patients. It is based on the current, evidence-based recommendations of the USPSTF and can be searched by specific patient characteristics, such as age, sex, and selected behavioral risk factors.

Patient Resources

The following are available:

- Screening for abdominal aortic aneurysm. Understanding task force recommendations. Rockville (MD): U.S. Preventive Services Task Force. Consumer fact sheet. 2014 Jun. 4 p. Electronic copies: Available from the U.S. Preventive Services Task Force (USPSTF) Web site.
- Screening for abdominal aortic aneurysm: U.S. Preventive Services Task Force recommendation statement. Summaries for patients. Ann Intern Med. 2014 Aug 19;161(4):I-26. Electronic copies: Available from the Annals of Internal Medicine Web site.
- Women: stay healthy at any age. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP007-A. 2014 Mar. 5 p. Electronic copies: Available in English and Spanish from the AHRQ Web site.
- Men: stay healthy at any age. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ). AHRQ Pub. No. 14-IP006-A. 2014 Mar. 5 p. Electronic copies: Available in English and Spanish from the AHRQ Web site.
- Women: stay healthy at 50+. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP002-A. 2014 Mar. 5 p. Electronic copies: Available in English and Spanish from the AHRQ Web site.
- Men: stay healthy at 50+. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP009-A. 2014 Mar. 5 p. Electronic copies: Available in English and Spanish from the AHRQ Web site.

Print copies: Available in English and Spanish from the AHRQ Publications Clearinghouse. For more information, go to http://www.ahrq.gov/research/publications/index.html or call 1-800-358-9295 (U.S. only).

Myhealthfinder is a tool that provides personalized recommendations for clinical preventive services specific to the user's age, gender, and pregnancy status. It features evidence-based recommendations from the USPSTF and is available at www.healthfinder.gov.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors

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NGC Status

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